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# MEDICINAL PLANTS HAVING ANTI-INFLAMMATORY ACTIVITY

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**ABSTRACT**

Inflammation is a healthy process of body which results from some disturbance or diseases. Herbal plants play a very essential role in the discovery of new drugs with less adverse effects. Herbal plants have played very essential role in human health care system since ancient times. To overcome these types of problems new drugs are very important and in plants have many of phytochemical constituents are present such as polyphenols, lignans, anthraquinones, flavonoids, alkaloids, terpenoids, saponins, polysaccharides and peptides. These phytochemical constituents are very helpful in inflammation and have very fewer side effects. In this article we have include some Herbal medicinal plants which has inflammatory activity which can be helpful in inflammation

**Keywords*:*** - Inflammation, Anti-inflammatory activity, herbal plants.

## INTRODUCTION

Inflammation is a host defense mechanism of the body and it is an essential immune response and it enables the body to survival during infection and injury and maintains tissue homeostasis in noxious conditions. According to the modern concept, it is a healthy process resulting from some disturbance or disease. Inflammation is a normal response to any noxious stimulus that intimidates the host and may differ from localized response to a generalized one [1]. In further words “Inflammation is the crucial and complex reaction of the body against infection upon tissue injury." The role of inflammation as a healing, restorative process, as well as its aggressive role, is also more widely identified today. But in some conditions appears to be never resolution and a chronic state of inflammation expands that may last the life of the individual. Such conditions incorporate the inflammatory disorders rheumatoid arthritis, osteoarthritis, inflammatory bowel diseases, retinitis, multiple scelerosis and psoriasis and atherosclerosis. To overcome this problem other kind of safe and effective anti-Inflammatory agents are available, including aspirin and other nonsteroidal anti-Inflammatory, with many more drugs under development. So the agents which are helpful to reduce the inflammatory response are called anti-inflammatory agent [2]. Inflammation is mainly characterized by the redness, swollen joints and joint pain, its stiffness and loss of joint function.

**Types of inflammation:**

Inflammation is mostly of two types they are-

Acute Inflammation: Acute inflammation is characterized by the exudation of fluids and plasma proteins; and the migration of leukocytes, most remarkably neutrophils into the injured area. This acute inflammatory response is trusted to be a defense mechanism aimed at killing of bacteria, virus and parasites while still facilitating wound repairs.

Chronic Inflammation: It is protracted and constant inflammation marked chiefly by new connective tissue formation. Inflammation is the common clinical conditions and rheumatoid arthritis is a chronic debilitation auto immune disorder [3]. It increases development of the degenerative diseases which includes- rheumatoid arthritis, atherosclerosis, heart disease, Alzheimer, asthma, acquired immunodeficiency disorder (AIDS), cancer, congestive heart failure, multiple sclerosis, diabetes, infections, gout, inflammatory bowel disease (IBD), aging and various neurodegenerative CNS depression [4].

**Process of Inflammation [5].:**

Inflammation processes can be classified into four groups:

1.Change in the blood flow supply to the affected area and causes change in smooth muscles cell function causing vasodilatation.

2.Contraction of the cytoskeleton in endothelial cells causes alterations in vascular permeability engendered.

3.Passage of the phagocytic leukocytes from capillary vessels into the surrounding interstitial spaces to the site of the inflammation.

4.Phagocytosis

**Symptoms of the Inflammation:**

There are various symptoms of inflammation and it is characterized by Pain, heat, redness, swelling and loss of function that result from the dilation of the blood vessels leading to an increased blood supply and from increased intracellular spaces which results in the movement of leukocytes, protein and fluids into the inflamed regions. It is very essential to understand the role of chemical mediators of inflammation. These mediators are the substances released as plasma proteins, or that come from cells like mast cells, platelets, neutrophils monocytes. These chemical mediators are triggered by allergic or chemical irritation, injury and infections. These chemical mediators are depended on the duration of the injury and determine the severity of inflammation and are termed pro-inflammatory fundamental factors. These chemical mediators bind to the specific target receptors on the cells and might be increases vascular permeability, promote neutrophil chemotaxis, stimulate smooth muscle contraction, increases direct enzymatic activity, induce pain or mediate oxidative damage. There are various examples of the chemical mediators are- nitric oxide, prostaglandins, leukotrienes, vasoactive amines (histamine, serotonin), and cytokines etc. [6].

**Mechanism of Inflammation:**

The inflammation process is a combination of many pathways like a synthesis of prostaglandin, interleukin and other chemo toxin, adhesive protein receptor action, platelet-activating factors. All pathways can act as chemotactic agonists. It initiates with any stress on the membrane and by other stimuli, these activates the hydrolysis of membrane phospholipid by phospholipase A into arachidonic acid, which further substrate cyclooxygenase and lipoxygenase enzyme and by product of these compounds are prostaglandins PGE2, PGH2 and leukotrienes like LTC4, LTB4 etc., [7]. Various cytokines also play essential roles in orchestrating the inflammation process, specially interleukin-1 (IL-1) and tumor necrosis factor-a (TNF-a). interleukin-1 and tumor necrosis factors are considered principal mediators of the biological responses to bacterial lipopolysaccharide (LPS, also called endotoxin).

These are secreted by monocytes and macrophages, adipocytes, and other cells. Working in concept with each other and various cytokines and growth factors which includes IL-8 and granulocyte-macrophage colony-stimulating they activate gene expression and protein synthesis in a variety of the cells to mediate and promote inflammation. Prostaglandin (PGE2) or prostacyclin (PGI2) release increases the blood flow as well as increases blood vessel permeability by assisting in release of nitric oxide from endothelium derived releasing factor which causes again vasodilation and help in sticking platelets and other chemo toxin (bradykinin, histamine) While LTs generally are pro-inflammatory LTB4 is a potent chemotactic agent for polymorphonuclear leukocytes, eosinophils, and monocytes. In greater concentrations, LTB4 stimulates the aggregation of polymorphonuclear leukocytes and boosts degranulation and the generation of superoxide. LTB4 boosts adhesion of neutrophils to vascular endothelial cells and their trans-endothelial migration and stimulates synthesis of pro-inflammatory cytokines from macrophages and lymphocytes [8].

Plants having Anti-Inflammatory activity:

**1) *Murraya Koenigii*:**

Biological name: *Murraya koenigii*

Common name: Curry leaf tree

Family: Rutaceae

Part used: leaves



Murraya Koenigii is also known as ‘Curry patta’ in Hindi language.

The family of the Murraya Koenigii is Rutaceae.

Uses: Generally, the use of the plant is stimulant, stomachic, analgesic and also used for the treatment of diarrhea, dysentery, insect bites. It is also used for allay heat of body.

Other uses: It is also used in wound healing. It has various activities likeantidiarrhoeal, anthelmintic, antibacterial, antifungal, antiulcer, antiobesity, and hypoglycaemic.

Saurabh Patel, et al. [9] was investigated the anti-inflammatory activity of methanol extracts of leaves of *Murraya koenigii.* In the carrageenan induces inflammation in albino rats at the dose of 400 mg/kg [9].

**2) *Zingiber officinale*:**

Biological name: *Zingiber officinale*

Common name:Ginger

Family: Zingiberaceae

Part used: Rhizome

Ginger is commonly for digestive health (indigestion, ulcer and constipation).

The family of the Zingiber officinale is Zingiberaceae.

Shimoda, et al. [10] was investigated the anti-inflammatory activity of Zingiber officinale and he prepared 40% ethanolic extract from the dried red ginger and find out its anti-inflammatory activity by using acute and chronic inflammation models. Finally, the result possessed found a potent suppressive effect on the acute and chronic Inflammation [10].

**3) *Solanum Nigrum*:**

Biological name: *Solanum Nigrum*

Common name: black nightshade

Family: Solanaceae

Part used: fruits

*Solanum nigrum* is commonly used for inflammation, tuberculosis and also used as diuretics.

The family of the Solanum nigrum is Solanaceae.

The result was obtained from the experiment that is conclude that the methanolic extract of *Solanum nigrum* have good anti-inflammatory activity and it shows the dose dependent activities. The result supports the use of this plant in inflammatory conditions and offers the presence of biologically active components which might be worth further investigation and elucidation [11].

**4) Aegle Marmelos:**

Biological name: *Aegle Marmelos*

Common name: Bilwa or bael

Family: Rutaceae

Part used: Bark

Aegle Marmelos has various activities like anti-cancer, anti-ulcer, anti-microbial and anti-inflammatory etc.

The family of Aegle marmelos is Rutaceae.

The aqueous extract of the root bark of Aegle marmelos was prepare and tested for anti inflammatory activity in albino rats by using carrageenan induced edema model and the cotton pellet induced granuloma and the standard drug was taken indomethacin and Aegle marmelos. The result obtained that anti-Inflammatory activity was express and inhibit at doses of 100mg/kg [12].

**5) *Achillea Millefolium*:**

Biological name: *Achillea Millefolium*

Common name: Yarrow

Family: Asteraceae

Part used: flowers, leaves and bark

*Aschille millefolium* is commonly used to treat fever, common cold, hay fever. It is also used for absence of menstruation, dysentery, diarrhea, loss of appetite, gastrointestinal (GI) tract discomfort. The family of the Achillea Millefolium is Asteraceae.

The anti-inflammatory activity of aqueous extract of Yarrow was investigated and measured by the mouse paw edema test. The result is obtained by the isolation of a material which decreases inflammation by 35% [13].

## CONCLUSION

Inflammation is a healthy process of body which results from some disturbance or diseases. But in some of the conditions when negative effect of the inflammatory activity is produced example, these inflammatory diseases are rheumatoid arthritis, osteoarthritis, IBD, retinitis, multiple sclerosis, psoriasis and atherosclerosis. To overcome these types of problems anti - inflammatory agents are very essential. For this type of purpose variety of safe and effective but long-term uses of these agents leads to side effects. There are various anti- inflammatory agents like aspirin, indomethacin and other nonsteroidal anti-inflammatories with much more drugs under development. So, these types of drugs also not useful in all cases in inflammation and these drugs produce adverse effects like, kidney problems, bleeding risks and ulcers. Herbal plants play a very essential role in the discovery of new drugs with less adverse effects. Herbal plants have played very essential role in human health care system since the ancient times. So, to overcome these types of problems new drugs are very important and in plants have many of phytochemical constituents are present such as polyphenols, lignans, anthraquinones, flavonoids, alkaloids, terpenoids, saponins, polysaccharides and peptides. These phytochemical constituents are very helpful in inflammation and have very fewer side effects. So, in this article we have include some Herbal medicinal plants which has inflammatory activity which can be helpful in inflammation.

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